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Cognitive and Social Factors Influencing Students' Response and Utilization of Facilitator Feedback in a Problem Based Learning Context

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Abstract

Purpose: Feedback within a problem-based learning tutorial can only influence learning if it is efficiently utilized. The purpose of this study was to explore perceived factors that influence student utilization of facilitator feedback within a problem-based learning tutorial.

Methods: It was an exploratory qualitative study that was conducted at an African Health Sciences University that has been using problem based learning for over a decade. The study involved third year students from across five health sciences disciplines that included: medicine, radiography, dentistry, nursing and pharmacy. Purposive sampling was the technique used to select the participants. These students had been previously exposed to problem based learning tutorials since their first year. Data was collected using both individual interviews and focus-group discussions. In total, twenty-five individual interviews and five focus group discussions were conducted.

Results: Both cognitive and social factors were discovered to influence students' use of feedback in a tutorial, and these have a reciprocal relationship, reinforcing each other to influence student learning. Key cognitive influencing factors included: overloaded feedback, unspecific and unfocused feedback, perceived limited knowledge of the tutor, differing feedback across tutorial groups and de-linking feedback from learning outcomes. The major social influencing factors included: language of feedback and communication, facilitator interpersonal skills, degree of participation of the facilitator, gender stereotyping and individualization of feedback.

Conclusion: Both cognitive and socio-contextual factors have the potential in influencing ways in which students receive and utilize facilitator feedback in PBL tutorials. Therefore, tutorial facilitators need to be cognizant of these factors when framing their feedback messages.

Keywords: Cognitive; Social; Problem-based learning; Feedback

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1. Introduction

1.1. Problem-based learning

Problem-based learning (PBL) in health professions education has been in application for long. First introduced in the 1960s at McMaster Medical School in Canada,[1] PBL has today been adopted across several institutions and many medical curricular are now based on PBL. PBL has also been introduced in many disciplines other than the health professions such as social work, science, engineering, business, management etc.,[2] and is widely advocated for particularly in science education.[3,4] PBL has been positioned as a transformative instructional strategy in reported literature, and one key component of PBL that is vital for its success is the provision of feedback to learners.[5] Unfortunately, literature on feedback within the specific environs of a PBL group setting in medical education is still murky, which necessitated this study.

The key reasons cited for the wide adoption of PBL include: training professionals with competencies such as critical thinking, problem solving, reflection, collaborative, self-directed as well as life-long learning.[6,7] PBL is a learning strategy where students in a small social group (i.e. the tutorial group) solve problems and reflect upon their learning processes collaboratively as a group.[8] PBL involves designing a learning task for the students which acts as the stimulant for learning. Such a learning task (i.e. the problem) could be a written narrative, clinical case scenario, medical image etc.

The learning task is addressed by the students in a real naturalistic context.[7] When solving the problem (i.e. learning task), students work in small groups called tutorial groups guided by facilitators. The facilitators do not teach, but rather just guide the students towards discovering new knowledge on their own.[9] Within the tutorial group, students brainstorm the problem and identify what they need to learn from the problem.[10] The group members then share information and propose various solutions. Unlike in traditional teacher-centered approaches where the teacher is the focal point of knowledge, in PBL, the emphasis is to promote learner-centeredness.

Therefore, the primary feature of PBL is contextualized learning through a problem solved by students within a tutorial group without formal lectures or prior preparatory study.[11] In PBL, the role of the teacher (who in the tutorial is also called a facilitator) is to guide students and promote sharing, interaction and exchange of ideas towards construction of new knowledge.[1,5] Such learning, in a problem solving social group like the tutorial group is aimed at enhancing activation of prior knowledge, elaboration of such knowledge and discovering new knowledge to build on prior knowledge.[12,13]

1.2. Linking feedback and the PBL tutorial

Within a PBL group, facilitator feedback to the students is very vital. Following the early origins and subsequent adoption in education, the concept of feedback in teaching and learning has been extensively studied with most literature emphasizing that if delivered effectively, feedback can be a powerful driver of student learning.[14–20] Feedback delivered in a PBL tutorial is aimed at facilitating and improving the learning process, not simply giving students summative marks. This type of feedback is called *formative feedback*. Formative feedback therefore refers to information or responses provided by facilitators to learners aimed at identifying students' learning strengths, learning gaps and providing opportunities for students to address those gaps.[21–23]

It has been reported that feedback responses from lecturers to students have in most situations been pointing out weaknesses on learning tasks accomplished.[23] The major assumption being that the weaknesses pointed out by lecturers can easily be transformed into action points by students in order to learn better. Provision of both strengths and weaknesses on student performance in a balanced manner has been reported as major factor considered by students when utilizing feedback received.[23] For feedback to promote effective learning, lecturers need to provide both strengths and weaknesses about students' learning tasks.[23] This allows students to critically reflect upon their achievements, while at the same time identifying gaps that need improvement.

Some students may be motivated by positive comments, others by negative comments while others could be motivated by both.[24] The onus lies on the feedback source (the facilitator) to find a balance between both positive and negative comments that will drive learning towards the desired direction. Carless[21] advises that, students should be given autonomy to actively construct their own understanding and meaning of feedback received in a balanced way. Barnett and Coate[25] alluded to this when they reported that feedback is aimed at; nurturing good learner behavior, informing students of their strengths and weaknesses, and expanding their learning prospects.

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In a PBL tutorial group set up, the role of formative feedback is very significant. The facilitator feedback helps students to assess their strengths as well as identify their learning gaps or learning areas that still need improvement. Immediate facilitator feedback within the tutorial also helps them to formulate an action plan to address the learning gaps identified. Therefore, the formative feedback from the facilitator acts as a very powerful strategy for enhancing learning and needs to be emphasized by all PBL facilitators.[19]

1.3. Context

At Makerere University, College of Health Sciences (MaKCHS) where this study was conducted from, PBL was introduced in 2003/2004 academic year across all undergraduate programs.[26] MaKCHS was the pioneer institution to introduce PBL as an instructional strategy in health sciences training in East Africa, though many other training institutions in the region have now adopted it. The institution trains students in five undergraduate health science disciplines namely: medicine (five year program with about 400 students across the five years), dentistry (five year program with about 75 students across the five years), radiography (four year program with about 75 students across the four years), pharmacy (four year program with about 100 students across the four years) and nursing (four year program with about 120 students across the four years).

Majority of the students admitted into the health sciences programs are males (about 51%), as compared to females (about 49%). Majority of the students admitted into the aforementioned undergraduate programs are directly from high-school while a few come in as mature entrants with a previous qualification of a Diploma in the relevant discipline. Newly admitted students are generally new to PBL as a learning strategy, but they are oriented to this new learning approach during their first weeks in the institution.

Uganda has many tribes and as a result, the institution admits a diverse group of students from different tribes though the dominant tribe (i.e. Baganda) where many students come from is from central Uganda. Nevertheless, the official language of instruction and assessment in Uganda's school system is English and so all students are competent in communicating using English. The PBL tutorials are also conducted in English. The curriculum at MaKCHS is majorly problem based (i.e. PBL) and it is based on the SPICES model which is Student-centered, Problem based, Integrated, Community based, Elective based and Systematic.[8,26] PBL is not limited to specific courses, but all courses integrate PBL within teaching and learning.

Learning is organized into integrated specific courses with each course being developed by experts from different disciplines, where each discipline contributes to the development of course content. In the first two years (foundational years), all students regardless of professional discipline attend tutorials together because they cover the same content which also promotes inter-professional learning (i.e. a single tutorial group may comprise students from medicine, nursing, pharmacy, dentistry and radiography). From third year onwards, students aggregate into specific disciplines.

Although all courses have a major component of PBL tutorials, there are other instruction strategies to engage the students which supplement PBL. These include; clinical exposure sessions, over-view lectures, laboratory sessions, skills training within the skills lab and seminars. Although feedback is practiced in each of the above teaching and learning strategies, this study specifically focused on feedback encountered within a PBL tutorial group. Each PBL tutorial group is comprised of 10–12 students with a facilitator for each group. The facilitator guides the group and also delivers feedback. Each group meets twice a week to discuss a learning problem.

In the first meeting, students convene with their facilitator to brainstorm a presented problem and come up with key learning objectives that guide their search for new knowledge. In the second meeting (after 2–3 days), students and their facilitator re-convene to discuss and share their new found knowledge. The PBL tutorial facilitators are faculty members (lecturers) at the institution, but are not necessarily content experts during tutorial discussions. Some PBL groups may have content experts as facilitators while others may have non-content experts. Due to inadequate human resources, it is not possible to have content experts for all PBL groups, an observation that has been previously reported.[13] However, at MaKCHS, all lecturers periodically undergo faculty development sessions on PBL facilitation and so both content experts and non-content experts are trained to be good PBL facilitators to manage the groups. Therefore, their level of experience in PBL facilitation is satisfactory. It has been reported that some times, well trained non-content experts even turn out to be the best PBL tutorial facilitators.[9]

Although PBL has been in practice for some time, there is limited literature on students' perceived factors that influence their utilization of facilitator feedback within the tutorial context. One assumption is that the

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facilitator feedback provided in the PBL tutorial will always be utilized by students effectively, which may not be true all the time. It is likely that there could be perceived factors that influence the utilization of such feedback. An exploration of these factors from the students' perspective was the purpose of this study. The overriding research question was: What are the perceived factors that influence students' utilization of facilitator feedback in a PBL tutorial to facilitate their learning? Through this paper, the terms facilitator and tutor have been used synonymously.

2. Methods

2.1. Overview

The study was conducted at Makerere University College of Health Sciences, Uganda, the oldest health professions training institution in East Africa. The institution trains undergraduate students across various health disciplines.

This study followed an exploratory qualitative design. Qualitative research is a type of research that aims at getting an in-depth understanding of a subject from the perspective of participants.[27] The strength of exploratory qualitative research lies in the provision of insightful elaborations, constructions and interpretations of unique situations as experienced by individuals.[27] Adopting this study design was aimed at getting an in-depth insightful understanding of students' perceived factors that influenced their use of facilitator feedback in a PBL tutorial.

2.2. Participants

The participants in this study were third year undergraduate health science students from across five disciplines namely: medicine, dentistry, radiography, pharmacy and nursing. These participants had been using PBL since they joined the institution. The participants included students who had joined right from high-school and those who had been admitted with a previous diploma qualification. Third year students were chosen because of two reasons. First, they attended tutorials within their specific professional disciplines and were not integrated. Secondly, they had adequate experience of the PBL tutorial process and were in a better position to provide rich experiences. First years were excluded because they were still new to PBL while fourth and fifth years were also excluded because they were not only rotating in busy clinical disciplines and thus had limited time to participate, but also each clinical discipline had its method of conducting the PBL tutorial.

Purposive sampling was used to recruit participants into the study. Purposive sampling is a type of sampling where a researcher deliberately selects participants due to their ability to provide necessary information required to answer the research question.[28] This type of sampling was therefore chosen because the students chosen (i.e. 3rd years) had previous experience of the feedback process within the PBL tutorial. They therefore had greater insight and information needed to address the purpose of the study. In total, twenty-five (25) individual interviews and five (5) focus groups were conducted (i.e. one focus group was conducted for each of the five disciplines). Each focus group had 6–8 students. It has been recommended in literature that a minimum of six (6) people are ideal for a focus group discussion.[29] The students who participated in the interviews did not participate in the focus group discussions. This was done to have many views from a wide pool of participants. The final number of individual interviews and focus groups was determined at data saturation point where no new information was emerging. This is a common practice in qualitative research.[28]

2.3. Materials

In-depth individual interviews and focus group discussions were the techniques used to collect data. Audio-recorders were used to capture the participant responses.

2.4. Procedure

The interviews and focus group discussions were conducted in English by the researcher with two other research assistants who also wrote down field notes. The questions for the individual interviews as well as for the focus groups explored the same issues though using different approaches for purposes of data triangulation.[30] Using these two approaches also allowed deeper exploration of the subject, maximizing the strengths while minimizing the weaknesses of each approach. While individual interviews allow a participant to freely express his/her views without being threatened by others, focus groups allow shared discussions and this triggers experiences to be remembered which would otherwise have been forgotten.[27,29]

Individual interviews were conducted before the focus group discussions. A quiet location was chosen for the interviews and focus group discussions. Each

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interview lasted for about forty minutes while each focus group discussion lasted for about one hour. During the interviews and focus group discussions, the researcher asked probing questions for clarity of ideas to engage the participants. Responses from interviews and focus group discussions were audio-recorded and later transcribed. Side field notes were also taken for purposes of reference and not forgetting key points. The data collected was put into electronic format and stored on one computer secured by a password and only accessible to the researchers.

The questions were open-ended and semi-structured which allow participants to freely express their views.[31] The questions purposely explored students' perceived factors that influence their utilization of feedback received from facilitators in a PBL tutorial. In order to explore the perceived factors, the researchers posed three questions to the students namely: (1) what are your views of feedback received from your PBL facilitator? (2) What aspects encouraged you to use the feedback to enhance your learning? (3) What aspects prevented you from using the feedback in your learning? The questions were developed by the researchers from a critical review of literature. Due to the nature of exploratory qualitative research taking place naturalistic settings, pilot studies are usually not necessary.[27] However, a pre-exercise can be conducted to get acquainted with questions and data collection techniques.[31] Therefore, in this study, a pre-exercise was carried to refine the questions and eliminate ambiguities such that the data finally collected effectively addressed the research purpose.

2.5. Analysis

Thematic analysis was used. Raw data was read and through a series of iterative and inductive open and axial coding, codes and themes were developed manually, a technique that is common in qualitative research.[32] The transcribed responses from both interviews and focus group discussions were analyzed and interpreted at the same time. The analysis did not only focus on identifying common responses, but also focused on identifying any key differences across the responses from participants.[33,34] Analysis was conducted manually by the researchers.

The process of analysis involved the three researchers each reading through the transcripts independently and identifying common phrases or responses which became the codes. Having developed the codes individually, the researchers then came together to further read through each other's codes as a team and relating them to the raw data. The developed codes were related to each other to generate broader categories of similar responses. These were also related to each other by the team and further grouped into broader areas called themes. In the few situations where discrepancies arose, there was consultation with an expert qualitative researcher to give an opinion that informed the final decision.

In order to achieve a degree of reliability of the independently generated codes (i.e. inter-coder reliability), the coders followed the same process that involved first reading through the each transcript and then going back to read each paragraph to identify common patterns. It should be remembered that this was a purely qualitative study strictly following an interpretive paradigm. Therefore, we argue that such a paradigm does not need to be subjected to strict reliability tests that are derived from the more positivist paradigm.[35] The findings were reported under these broader themes with key representative quotations.

2.6. Quality assurance

Participants were invited to validate the emerging themes as well. Additionally, researcher bias was minimized by having more than one researcher carrying out the coding of data. The researchers also practised reflexivity and bracketing.[28] This involved the researchers reflecting upon their role in the research process and avoiding all pre-conceived ideas or any subjective experiences on the subject under investigation throughout the research process. Using multiple data collection methods also added rigor to this study.

2.7. Ethical considerations

Participants within the five tutorial groups involved provided written informed consent before starting the study. No participant was identified by name and the responses were kept anonymous and confidential. Permission to conduct the study was granted by the Health Research Ethics Committee, Faculty of Medicine and Health Sciences, Stellenbosch University.

3. Results

The purpose of this study was to explore perceived factors that influenced students' utilization of facilitator feedback received in a PBL tutorial. Therefore, the findings described were from the context of students' previous experiences of facilitator feedback within a PBL tutorial. Various factors were identified from the

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interviews and focus group discussions. From the exploration of the students' perceptions, these factors were found to be both cognitive and social. These are presented under themes one and two. The themes and subthemes are summarized in Table 1.

In the context of this study, cognitive factors refer to those perceived factors that involved the students' mental and thinking processes towards feedback received. In other words, these factors originated from within the students' internal mental processes. Social factors refer to external perceived influences outside the students' internal thinking processes, but occurring within the PBL social learning environment. Having explored these perceived factors, a linkage between the cognitive and social factors was then developed to explain how these factors could influence students' utilization of facilitator feedback.

3.1. Theme 1: cognitive factors

Participants in this study were influenced by perceived cognitive factors in receiving and effectively utilizing feedback to enhance their learning. In analysis of the data obtained, we observed no major variations in responses of the students across all the five disciplines from which the participants were drawn, though occasionally a few students differed in their responses. Most of the factors pointed out by the participants either explicitly or implicitly were similar across the different disciplines i.e. medicine, nursing, radiography, pharmacy and dentistry. Within this broad theme, several key sub-themes emerged which include: overloaded feedback; unspecific and unfocused feedback; perceived limited knowledge of the facilitator; differing feedback across tutorial groups; and de-linking feedback from students` prior knowledge and learning outcomes.

Table 1
Showing the major themes and respective sub-themes.

Major theme	Sub-themes
Cognitive factors	
	• Overloaded feedback
	• Unspecific and unfocused feedback
	• Perceived limited knowledge of facilitator
	• Differing feedback across tutorial groups
	• De-linking feedback from learning outcomes
	• De-linking feedback from students' prior knowledge
Social factors	
	• Feedback language and communication
	• Facilitator interpersonal skills
	• Degree of facilitator participation in the tutorial
	• Gender stereotyping
	• Individualization of feedback

3.1.1. Overloaded feedback

Out of the fifteen (15) interviewed students, thirteen (13) expressed concern that the facilitators overload feedback messages in many situations, delivering too much information at once and giving them limited time to comprehend the information. This observation was also evident in all the five focus group discussions conducted. The following responses were typical of this observation:

> "*The feedback given to us is many times too much, so the brain ends up getting overloaded with too much information at once.*" [Medicine student]
> "*I appreciate feedback is good, but giving us too much information is not only frustrating, but also de-motivates many of us to use it to improve our learning…*" [Radiography student]

Although two (2) interviewed students did not complain about feedback overload, their responses implicitly demonstrated that the overloaded feedback still had the potential to affect their learning.

> "*The fact is that feedback was sometimes too much. However, I just sieved through to pick what was useful….this was time wasting and probably affected my other learning activities.*" [Nursing student]
> "*The too much feedback given to us was sometimes good because it allowed me to look at so many aspects pointed out by the tutor…however, my brain would at times switch off as it became boring.*" [Medicine student]

From the above two responses, one can observe that though some students probably liked the overloaded feedback, it indirectly affected their learning negatively as they got cognitive load.

3.1.2. Unspecific and unfocused feedback

Linked to the previous factor, but also came out prominently was the issue of un-specificity of feedback. In addition to receiving too much information, all fifteen (15) interviewed students reported that the feedback was sometimes too general and not focused to a particular aspect that the facilitator wanted to

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address. There were no observed variations in responses across the five health science disciplines from which the interviewees were chosen. The following responses were typical of this observation.

> "*The facilitators are sometimes to general in what they give us as feedback….I wish the feedback was properly organized targeting only those particular aspects that need improvement.*" [Medicine student]
>
> "*In all the tutorials I have attended, the feedback from my facilitator seemed not to be focused….too much generalization leaving me wondering what particular aspects I did well and where exactly I need to improve…I just ignored such feedback after the tutorial.*" [Pharmacy student]

From the above responses, one can discern that sometimes, the facilitator feedback seemed to be too generalized, random and not structured to particular areas of strengths or weaknesses. The above responses were also echoed in all the five focus groups conducted pointing to the fact that the facilitators sometimes gave too many comments that seemed to confuse the students.

3.1.3. Perceived limited knowledge of facilitator

From our findings, there was a perception from some students that some facilitators lacked knowledge of the subject during the tutorial, so they did not take their feedback seriously. This response was directly or indirectly expressed by fifteen (15) interviewed students and in four (4) of the five focus groups. The responses below captured this.

> "*We really think some of our facilitators are not content experts and you can see this during the tutorial. When you seek for clarification, they seem not to know….for such a facilitator, we cannot take his feedback seriously.*" [Nursing student]
>
> "*Some facilitators tell us from the beginning of the tutorial that they are not content experts in the problem we are handling….surely no student can trust feedback from such a facilitator to inform their learning.*" [Dentistry student]

From the responses above, there is a general perception from students that facilitators who are not subject experts cannot deliver useful feedback to enhance their learning. However, in one focus group, there was an observation that facilitator knowledge did not influence the way in which students received the feedback as expressed in the response below.

> "*Some facilitators evidently lacked adequate knowledge of the content, but delivered optimum feedback. Their lack of knowledge did not significantly deter us from learning in the tutorial.*" [Medicine student]

The above response significantly varied from the majority and looking at this focus group, it was majorly composed of mature students with previous qualifications and probably adequate prior knowledge of the content.

3.1.4. Differing feedback across tutorial groups

Students across different tutorial groups often compared feedback messages received from their respective facilitators. A major finding was that the feedback sometimes addressed different domains which left students wondering whether they had received enough.

> "*It seems the facilitators do not follow the same guidelines when giving feedback….sometimes you find that one facilitator gives feedback on many aspects of the tutorial discussion including participation and time management while another simply focuses on one aspect.*" [Radiography student]
>
> "*Even when giving feedback on only knowledge we have acquired, the facilitators differ in how deep they give feedback…some point out what you have done well, others what you need to improve only and others may be both…this has forced me to occasionally request to change tutorial groups to go where I benefit from feedback.*" [Dentistry student]

From all the fifteen (15) interviews and all the five focus groups, the issue of receiving feedback on different domains was observed. For example, eight (8) interviewed students said that they received feedback on knowledge, but not on issues such as participation and time management, five (5) students reported that they only received feedback on what they did wrong and not what was done well, in three of the five focus groups, there was agreement that feedback was often given on knowledge, but not on team work and participation in the tutorial, while in two focus groups, the observation was that the facilitators ably delivered feedback on not only knowledge, but also on competencies such as team work, participation and leadership. Therefore, it is evident from these findings that facilitators did not focus on delivering feedback across similar domains.

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3.1.5. De-linking feedback from prior knowledge and learning outcomes

A significant observation was made in all fifteen (15) interviews and all five (5) focus groups that PBL tutorial facilitators often failed to link their feedback messages to the students' prior knowledge and to the intended learning outcomes. This seemed to affect students' utilization of the feedback received.

> "*I would appreciate the feedback more if it recognizes what I already know and shows me how what I already know can be linked to what I should know and what the lecturers expect me to know.*" [Nursing student]
>
> "*In many cases, I failed to effectively fit in my mind the feedback received from my facilitator because it often failed to connect what I already knew to what I need to know in order to achieve what was intended by the problem. Simply telling me my learning gaps without connecting those gaps to what I already know and what I should know is not very effective.*" [Medicine student]

We did not observe any major variations across the participants regarding this sub-theme and it repeatedly came up throughout the interviews and focus group discussions from all participants.

3.2. Theme 2: socio-contextual factors

Perceived external factors within a PBL tutorial setting and outside the students` internal thinking processes also seemed to influence the effective utilization of facilitator feedback. From this broader theme, the following sub-themes were defined: feedback educational language; facilitator communication and interpersonal skills; degree of facilitator participation in the tutorial; gender stereotyping; power differentials; individualization of feedback; and lack of clear rules and roles.

3.2.1. Feedback language and communication

The role of feedback language and communication was expressed by all participants in this study. Nearly all responses repeatedly pointed out the issue of language and communication across all interviews and focus groups. PBL facilitators used language that made it difficult for the students to effectively utilize the feedback. Facilitators often used complicated technical words that were evidently unclear to students. Sometimes, facilitators used medical jargon to frame their feedback which was also confusing to the students. Occasionally, feedback was framed in a way that actually impeded learning especially the negative feedback that explicitly seemed to castigate the students. There was a clear limited use of simple concise words used in everyday normal communication by the students. There was also a serious concern of how facilitators failed to package the 'negative' feedback in a positive way, and this was a common thread across all interviews and focus groups. The following responses are key examples to illustrate this:

> "*Although we appreciate that we are medical students, facilitators need to use simple words when giving us feedback. Using complicated medical words and phrases without explaining them to us is a waste of time …because they do not help us learn.*" [Pharmacy student]
>
> "*As students, we keep learning. Rudely pointing out my mistakes in an angry tone and using strong words by the tutorial facilitator just scares me away from learning…treat us like future colleagues.*" [Dentistry student]
>
> "*Many facilitators are actually good, but they do not know how to communicate their feedback. I think a good communicator needs to find out whether the students have received the intended message and have understood it. Many of them do not do this besides using very complicated words and looking very scary and disinterested when talking to us.*" [Pharmacy student]

From the responses above, one can observe the significant role communication and language used by facilitators to deliver feedback can play in the feedback process.

3.2.2. Facilitator interpersonal skills

Although this sub-theme was not evident in all the individual interviews, it strongly came out in all the five (5) focus groups and in ten (10) of the interviewed students. Facilitator relationship with students was also a key factor. Some facilitators related well with the students and students seemed to pick up interest in their feedback more than those facilitators who never had a good relationship with the students. The following responses were typical from the focus groups.

> "*I think the facilitator should be part of the tutorial and a friend to the students. Some facilitators do act like soldiers and create fear amongst students. As students we punish such people by not listening to their feedback.*" [Radiography student]
>
> "*I have observed that facilitators who relate well with students often give feedback that every student*

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yearns for. Some of them behave like fathers and mothers to us, so we take their feedback seriously." [Medicine student]

Though majority of individually interviewed students (12) did not explicitly raise the issue of facilitator interpersonal skills, it remains a strong factor as it strongly dominated the focus groups.

3.2.3. Degree of facilitator participation in the tutorial

Our findings also demonstrated that students took seriously feedback from facilitators who were actively engaged and participated in the tutorial from beginning to end. The feedback from facilitators who were perceived to be inactive and disconnected with the tutorial was ignored.

"*In a number of tutorials, our tutor seemed to be disinterested in our discussion….reading newspapers most of the time…feedback from such a facilitator at the end of the tutorial is not useful… if he has not been paying attention, what is he commenting about?*" [Nursing student]

"*In many cases, facilitators just keep quiet, are busy with their phones or keep moving out of the tutorial to attend to other matters…we cannot take their feedback seriously because they clearly lack an active presence in our discussions.*" [Dentistry student]

We discovered no variations across all the responses on this sub-theme. All students in the interviews and focus groups pointed out the fact that they would not positively receive feedback from passive tutors. One student was very explicit in this:

"*Some facilitators were so inactive, busy reading newspapers or on their phones during the tutorial discussion and not saying anything. I can never listen to feedback from such facilitators.*" [Dentistry student]

3.2.4. Gender stereotyping

It was interesting to observe the influence of gender within the tutorial which came in form of comments from tutors. Some of these comments were perceived as offending to some students. From our observation, students who felt offended by such gender sensitive comments often switched off and never took the feedback from that particular facilitator seriously. Majority of the interviewed students (i.e. 7) who expressed this were female students. The issue of gender was also expressed in three of the five focus groups. The following statements were significant to illustrate this.

"*In one of my tutorials, there was a facilitator who openly said that he liked boys more than girls because they are naturally more confident in the discussion. This put off many of the girls including myself and whatever feedback that facilitator gave, the damage had already been created. We ignored all his information.*" [Medicine student]

"*When a facilitator says that he has a bias towards females because they are always emotional even during arguments within a tutorial discussion, I cannot take such a facilitator seriously because of such misconceptions. Even feedback from him could be biased not objective.*" [Nursing student]

The gender issue was also observed amongst two (2) male students who had this to say:

"*In one tutorial group, the facilitator used to say that boys are naturally aggressive and always want to be told what they want to hear. This means that the facilitator will never tell the boys the truth if they do not want to hear it. How can I consume feedback from such a facilitator?*" [Dentistry student]

"*My tutor always said that he prefers a group with more females than males because boys are never prepared, have a big ego and always disrespect the tutor because of their masculinity. Such a statement showed that the facilitator was not interested in us the boys and this affected our perception of him and his feedback. Certainly I never paid attention to his feedback myself.*" [Pharmacy student]

The remaining six (6) students who participated in the interviews were males and did not express the issue of gender in feedback utilization. Again, two focus groups did not explicitly bring out the issue of gender, but it remains significant in a tutorial group setting.

3.2.5. Individualization of feedback

There was an observation that focusing feedback on a particular student within the tutorial group in the presence of peers affected the way in which some students responded to that feedback. Although this was not a common thread through all interviews and focus groups, it was observed in ten (10) of the interviews and three (3) of the focus groups. This was particularly true when it came to negative feedback pointing out learning gaps that seemed to cause embarrassment to the students.

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"*Pointing out areas of weakness is good, but doing it in front of our colleagues is embarrassing. Sometimes this causes one to be ridiculed by other students that we do not know which de-motivates our learning. I think the facilitators should deliver feedback to the whole group without mentioning individual student names within the tutorial…they can then summon the individual students after the tutorial in their offices to deliver the very personal feedback. Surely I cannot use that feedback that has caused me embarrassment and ridicule.*" [Medicine student]

4. Discussion

This study explored perceived factors that influenced students' utilization of facilitator feedback within a PBL tutorial. It was observed that there were no significant variations in responses from students across the different disciplines from which they were drawn. The reason as to why students across the different professional disciplines pointed out similar factors that influenced their utilization of facilitator feedback received in a PBL tutorial is not straight forward.

One plausible explanation for the above observation could lie in having a similar learning environment. Though drawn from different disciplines, the students share the PBL facilitators across the entire span of an academic year. At the end of every course, PBL facilitators usually change their tutorial groups and are randomly allocated new ones, regardless of which discipline. Therefore, the students in one discipline have high-chances of having a facilitator from another tutorial group at the end of every course. Thus the same tutors most likely facilitate a variety of tutorials using the same facilitation skills. The perceived factors that influenced students' use of feedback were found to be both cognitive as well as social. From this study, it was observed that PBL facilitators need to be aware of both cognitive and social factors from the perspective of students within a PBL community of learning. Delivering feedback to an individual student on written assignments for example is different from delivering feedback to a group of students in a small social community of learning like the PBL tutorial group.

4.1. Cognitive factors

There were various perceived cognitive factors that influenced students' utilization of feedback. These factors seemed to be primarily focused on students' cognitive and psychological processes and how they perceived the feedback received. The issue of cognitive load to students observed in this study is in resonance with previously reported literature that overloading students with information can actually block learning.[19] Giving too much feedback information to students at the end of the tutorial probably prevents them from picking out what is actually important at that particular time to enhance their learning, creating mental confusion and subsequently, students may not utilize that feedback effectively.

In the process of giving feedback, teachers need to avoid giving too much.[18] Giving too much feedback at the same time has been reported to result into blockage of the learning process, overload of working memory and impeding meta-cognitive and reflective processes of students in the process of knowledge construction.[22] This results into the negative aspect of feedback which is impairing the learning process.[23] One way of addressing this is for PBL facilitators to pick out only particular feedback messages that are relevant at particular points in time during the tutorial process instead of waiting to give all the feedback at the end of the tutorial discussion. The above observation is also related to the observation that feedback was in some cases unspecific and unfocused. It has been previously reported that for feedback to be effective, it needs to be specific.[18]

Our findings are in agreement with this previous literature in that students reported that feedback which appeared to be too general and unfocused to particular aspects was not useful in their learning. From the study findings, one gets a feeling that feedback received by students focused on too many aspects, was not well structured to address particular observations and this

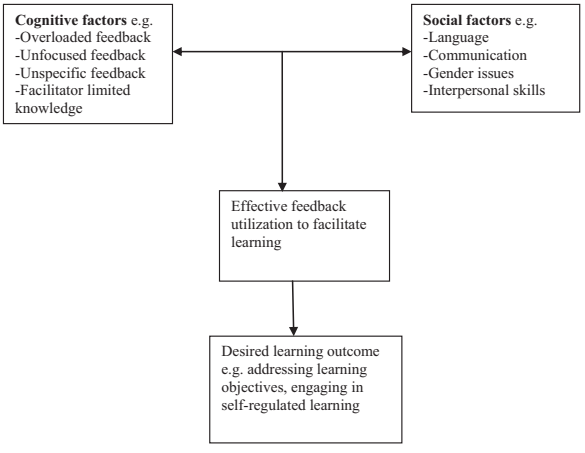

Fig. 1. A theoretical framework relating cognitive and social factors that influence student utilization of feedback in a PBL tutorial.

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prevented students from effectively utilizing it. Carless et al.[22] have previously reported that feedback needs to be specific to particular areas that the recipient needs to focus on. We do concur with this and further caution PBL tutors against giving feedback in broad terms. There is need to focus on only specific strengths and weaknesses of the students that are directly linked to their learning.

The key implication for practice here is that students sometimes do not use the feedback delivered to enhance their learning because that feedback is either too much for them to handle at a go or the feedback is not focused to a particular aspect that needs to be improved. These assertions have been previously reported in literature.[20,21] Therefore, PBL facilitators should only deliver key specific feedback messages in small quantities in order for it to be effectively utilized by students. For example, there might not be need for PBL facilitators to wait to give feedback at the very end of the tutorial process. Facilitators may periodically intervene as the tutorial progresses to give key feedback as students discuss. This is likely to overcome the practice of giving overloaded feedback at the end of the tutorial discussion.

Interestingly, many students never utilized feedback from a facilitator whom they perceived has having limited knowledge of the content. Obviously this was just a perception, but it could also be true that some facilitators demonstrated lack of knowledge in the subject they were facilitating. It is not always possible to have subject experts to be PBL facilitators all the time.[2] This challenge even gets worse in institutions with limited human resources, often leading to using lecturers who are not subject experts to act as facilitators of PBL tutorials. The challenge is that if the facilitator demonstrates to students that he/she is not an expert, students are most likely not to take feedback from such a facilitator seriously. However, it is also true that non-experts have turned out to be some of the best PBL tutorial facilitators and vice versa.[5]

One way of addressing the above challenge is to train both experts and non-experts to become good PBL tutorial facilitators who can deliver highly effective feedback. In many situations, the training has been complimented by developing facilitator guides which both the expert and non-expert facilitators can read before the tutorials to acquaint themselves with the subject.[12] Sadly though, the facilitator guides focus on only content and there is no mention of how the facilitator can deliver effective feedback within the tutorial. There is thus need to enrich the facilitator guides by probably developing a feedback guide which shows facilitators the steps to follow when packaging their feedback and which aspects to concentrate on. Developing PBL tutorial feedback guides is also likely to address the challenge of differing feedback messages from facilitators. This is because; facilitators will be following exactly the same guidelines and focusing on the same aspects of the PBL tutorial discussion when packaging their feedback.

A key observation arising out of this study was that feedback that failed to link students' prior knowledge and expected learning outcomes was not utilized by students. Often, feedback is given on the current activity, in this case the tutorial discussion. Many tutors do not relate the feedback to what students already knew and to what they ought to know. This is probably an eye-opener to all people involved in training that students probably want to see the prior knowledge linked to what they have currently acquired and this linked to what they are expected to know.

4.2. Social factors

It was interesting to note that social factors came into play and probably these have been neglected by many PBL facilitators. It should be noted that a PBL tutorial is a social learning group and besides cognitive and psychological processes of the students, there are also contextual and environmental aspects that need to be considered. For example, the issue of feedback language and communication skills used by the facilitator actually prevented many students from utilizing the feedback received. In applying regulatory focus theory, Van Dijk and Kluger[24] intimated that some students could be motivated by positive feedback while others by negative feedback. Although this may be true, the language used to package this feedback and how this feedback is communicated are crucial.

Language in this context needs to be considered broadly to include use of simple and clear words, avoiding technical medical jargon that students do not understand, framing the feedback message in a manner that will actually not impede learning.[18] Specifically, framing perceived negative feedback in a positive way can greatly enhance learning. The facial expressions demonstrated by the facilitator while delivering the feedback are also crucial. As observed in this study, students disregarded feedback from a facilitator who facial expressions exhibited anger and disinterest in the students. This observation has not been previously reported in feedback literature.

The extent to which the PBL tutor got engaged with the tutorial discussion and the manner in which such a

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tutor related with the students was also a major observation from many students. From our findings, it appears like a facilitator who is not an active participant in the tutorial discussion is not likely to be in the know of the different opinions, ideas and arguments that students have been discussing. Such a facilitator is therefore not likely to give very engaging feedback based on the students' discussion, an observation that has been previously reported.[7] Students seemed to observe such facilitators and their feedback was deemed not necessary. It is thus advised that all PBL facilitators need to concentrate on the student tutorial process and become part of the learning community. This allows them to follow the lines of discussion and subsequently frame the most effective feedback to the students.

A highly significant factor found out is what we termed as '*gender stereotyping*' within the tutorial group. The use of gender sensitive statements by PBL facilitators towards students and their probable influence on how victim students use the feedback from that very facilitator has not been explicitly reported in medical education literature. This was an important finding that could stimulate discussion. The issue of gender was mostly pointed out by female students who are therefore more likely to get affected by such statements as compared to the male students. In deconstructing this observation, one should note that a PBL group is a social setting and any comments directed towards students in form of feedback need to be packaged cognizant of the environment in which learning is taking place.

Comments from a facilitator that are directed towards a certain gender (either female or male) within the tutorial setting can disengage the victim students from learning.[25] Such students are most likely to become withdrawn and biased towards that particular facilitator and even when the facilitator delivers useful feedback, students are not likely to listen to that feedback. Such discriminatory comments from facilitators spoken out either consciously or unconsciously need to be avoided at all times within the tutorial as they not only cause embarrassment to the students amidst their peers, but also act as de-motivating cues towards learning.

4.3. Linking cognitive and social factors: a theoretical framework

From the findings of this study, there are many factors that could influence feedback utilization by learners and these could originate from both within the student (cognitive) or from outside (social environment). Some of these factors have been implicitly or explicitly reported in previous literature.[18,20,22] However, what this study adds to existing literature is the linkage of both cognitive and social factors. It appears like from the perspective of students, these factors do not operate in isolation, but rather influence feedback utilization simultaneously. We thus propose a theoretical framework linking both cognitive and social factors (Fig. 1).

The framework in Fig. 1 postulates that both perceived cognitive and social factors are likely to influence students' utilization of facilitator feedback within a PBL tutorial group. These factors have a linear relationship and reinforce each other at the same level in influencing students' effective utilization of facilitator feedback within a PBL learning group. Although learning is mostly an internal cognitive process, the social environment in which that learning takes place is equally crucial. A PBL group is a social setting and feedback utilization by students within that social learning group is affected by both their cognitive perceptions as well as their social context in which they are situated.

To achieve the desired effects of feedback delivered within a PBL tutorial learning group, facilitators need to be aware of both the students' internal mental perceptions (cognitive factors) as well as the external influences (social factors). For example, feedback from the facilitator that is perceived by students to be well organized, focused to particular aspects, links prior knowledge and expected learning outcomes and at the same time communicated using simple clear language by an active, friendly and knowledgeable facilitator is much more likely to be received and well utilized by students to promote their learning than feedback that is perceived to be unfocused, from an unknowledgeable facilitator and communicated using rude and unclear language.

Thus the framework provides a useful platform for PBL facilitators to shape their feedback messages. Findings from this study generally resonate well with previous literature that for feedback to be effective, it should be clear, timely, focused and not overloaded.[7,18,23] The key implication of this particular study to feedback practice is that various factors are likely to influence students' use of facilitator feedback within a PBL tutorial. These factors are not only about the students' mental processes (cognitive factors), but also about the immediate external influences within a PBL tutorial setting (social factors). These factors operate simultaneously within the PBL tutorial

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environment to influence the manner in which students receive and utilize facilitator feedback. Therefore, PBL tutorial facilitators need to be aware of these perceived factors when framing their feedback messages. Key findings such as the influence of gender statements as well as communication and feedback language within the tutorial rooms need to be taken into consideration by PBL facilitators.

There are limitations to this study which open up gaps for key implications for further research on the subject. The non-probability sampling and small participant numbers are major limitations of this study. Therefore, the theoretical framework from this study linking cognitive and social factors in a linear relationship needs further scrutiny through other empirical studies in other settings. Another limitation of this study is that it focused only on the students' experiences and not the PBL tutorial facilitators. Having views from the facilitators would probably have added richness to our findings.

We thus propose further studies on the subject exploring the views of PBL facilitators as well. A significant observation from this study was the role of gender within a PBL tutorial group setting. Gender sensitive statements seemed to affect the way in which students received feedback. We propose more studies exploring the issue of gender within a social learning group such as the PBL group. More research is also needed on how feedback practice can be structured such that PBL facilitators deliver feedback on the same competency domains across different tutorial groups.

4.4. Conclusion

This study has shown that simply delivering feedback within a PBL tutorial setting is no guarantee that students will use that feedback to promote their learning. There are various factors that influence the utilization of such feedback by students towards desired learning. These factors; both cognitive as well as social reinforce each other at the same level. For feedback delivered in a PBL social learning group to be more effective, facilitators need to be aware of all these factors and consider them when framing their feedback messages.

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Disclosure

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